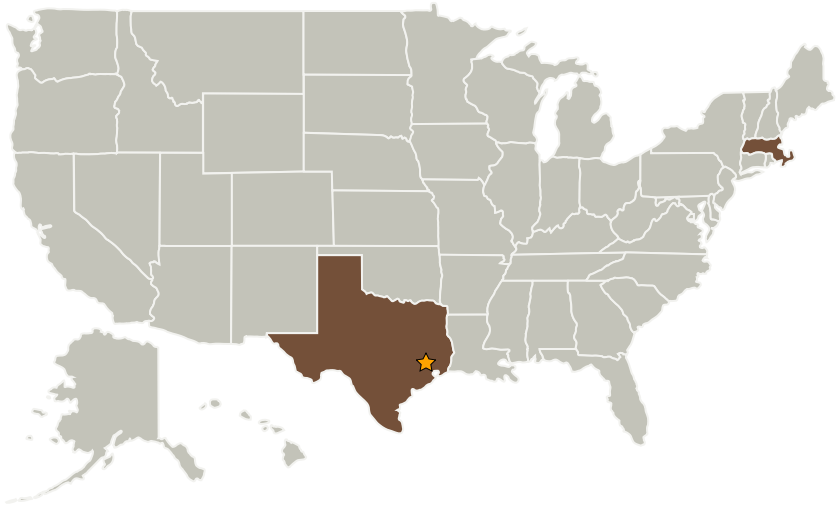
# Nanoscale Test Strips for Multiplexed Blood Analysis, Phase I

Completed Technology Project (2009 - 2009)

## Project Introduction

The goal of our nanoscale test strips, or nanostrips, is to provide rapid, low-cost, powerful multiplexed analyses in a diminutive form so that whole body health checks can be performed on a single drop of blood. The approach is conceptually similar to pH or urinalysis test strips which allow multiple measurements in a linear format. The main difference is that we are proposing test strips at the nanoscale, shrunk in size over 100,000-fold in surface area, allowing multiple sensing elements to be included in a small area. The fluorescence from each element assesses the concentration of each measured analyte. In this Phase I, we will fabricate, test, and characterize test nanostrips and fabricate ones for bone metabolism. For Phase II, we will develop an entire suite of nanostrips for cardiac function, bone metabolism, liver function, lipid analysis, and hormone measurements. The nanoscale test strips are read in a time-of-flight flow-based manner utilizing our rHEALTH (Reusable Handheld Electrolytes & Lab Technology For Humans sensor) sensor, which is a low-cost, handheld sensor that employs a reusable microfluidic chip, developed with NASA funding. At the end of Phase II, the nanostrip assay suite will be delivered together with a handheld rHEALTH sensor.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Johnson Space Center(JSC) | Lead Organization | NASA Center | Houston, Texas |
| The DNA Medicine Institute | Supporting Organization | Industry | Cambridge, Massachusetts |

| Primary U.S. Work Locations | |
|---|---|
| Massachusetts | Texas |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.6 Instrumentation and Health Monitoring for EDL